

engadget[®] distro

102111 #9

the ANDROID INVASION

Samsung's Galaxy Prime, HTC's Sensation XE,
Motorola's Droid RAZR and the Amaze 4G

plus

A taste of Ice Cream Sandwich

Our first Ultrabook: Acer's Aspire S3

Tom Merritt: Growing Up Geek

Google challenges itself with dueling Android superphone launches, and RIM finally talks QNX on a phone

editor's letter

If last week was owned by Apple, with the launch of the iPhone 4S and release of iOS 5, this week Google took things over with not one but *two* big events, both taking place on the same day — despite one being on the other side of the world from the other. ¶ First was the NYC Motorola event, in which Sanjay Jha made us sit through the announcement of the Motoactv (basically, a \$249 Android-flavored iPod nano with a nerdy workout angle) before showing us what we'd really come to see: the Droid RAZR. It's the rebirth of what was perhaps the most iconic flipphone ever made and, while this new model bears no resemblance to the first other than a name, we still think it looks mighty sharp.

It's a 4.3-inch device fronting a qHD Super AMOLED display, processing handled by a dual-core 1.2GHz TI OMAP chip paired with 1GB of RAM and 16GB of storage. It has LTE and, despite that, is just 7.1mm thin. That's a huge decrease



from other devices that use the same 4G tech and, as if that weren't good enough, Moto is promising up to 12.5 hours of talk time on a single charge. If

it can manage that with LTE enabled it'll be a revolution.

What it won't manage is running Ice Cream Sandwich — at least not at launch. ICS was unveiled later that same day at a Samsung event in Hong Kong. (Technically it was the next day, but don't ask me to figure it out. I'm still too jet-lagged to really know what day it is.) At this event we finally saw the official unveiling of the Galaxy Nexus, a device that doesn't seem to fit into Samsung's new naming scheme any better than it will fit into those pants of yours with the tiny pockets — at 8.94mm it's only slightly thicker than the RAZR, but its 4.65-inch screen makes for a phone with... presence.

It too has a 1.2GHz TI OMAP processor and a Super AMOLED display, but this one makes use of that

extra acreage to step up to proper high definition — 720p to be exact. It looks to be a very, very promising device and our extensive hands-on time with the thing echoes that, leaving us to wonder just what Google was thinking when it let these two devices out the door on the same day. The RAZR, with its Gingerbread install, immediately looks dated.

Motorola has promised it will receive Ice Cream Sandwich sometime in 2012 (as, indeed, will most Gingerbread-having phones) but we can't help thinking a better tactic would have been to simply delay the thing. After all, Google owns Motorola; it's not like they wouldn't have seen it coming.

And what of Ice Cream Sandwich? This is Android 4.0, the one OS to rule them all, be they tablets or phones or that burgeoning class of device that slots uncomfortably in between the two. The promise for unification (and, by definition, ending fragmentation) is great, and for that we're optimistic, but ultimately ICS is not going to revolutionize the way you use Android. And, if you don't use Android, it's not likely to change that either.

But, if you're on-board with Google's little green robot guy, you will like what's new here.



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Most notable are the almost invisible graphical tweaks scattered throughout — fancier transitions and subtle reformatting of applications to make everything look and feel better to interact with. The apps have been improved too, like Gmail with offline search and a Gallery app with simple photo editing. You can now unlock your device via facial recognition (and a front-facing webcam, naturally) and, if it has NFC, exchange webpages and contacts and other simple information with the simple touch of two devices. That trick is called Android Beam and it's one of the most promising implementations for near-field communication we've yet seen.

The Galaxy Nexus launches in November and will be the first device to rock Ice Cream Sandwich. We were told by Matias Duarte and other members from the Android team that the Nexus S will be getting its own upgrade soon, and that other Android Gingerbread devices should be compatible — whether their manufacturers will choose to upgrade them, of course, is another story. And, when they do, we're also curious just how ICS will look when burdened with Blur or Sense or whatever. The OS is, we've confirmed, just as easy to skin as

all the other flavors before.

In other Android news, Google's Andy Rubin confirmed that the company has shipped about six million tablets running the OS. That's nearly twice the amount banded about earlier this week when a developer did the math based on overall tablet sales and reported Android penetration and came up with a number of 3.4 million. Six million does indeed sound like a lot — until you realize that Apple sold 11.25 million iPads *last quarter*. That is, I must say, a gap I expect to see start closing in short order.

It wasn't all about Android all week, though, with RIM finally unveiling BBX, its phone-friendly version of the QNX operating system that currently powers the PlayBook. Well, the company didn't actually show the thing running, or even really tell us when it might ship, but it is said to be like Ice Cream Sandwich in that it'll run on tablets and phones alike. Eventually.

Finally, Microsoft seems to be listening to the cries of users who hate the new Start screen in Windows 8 — a giant, colorful Metro-esque collection of icons that'll look great on a tablet yet looks almost unus-

able on anything with a mouse. Redmond's best promised the ability to customize that big grid into groups, and also is presenting smaller icons to get more up on the screen in one shot. We power users don't have time to scroll, Microsoft.

If your week was anything like mine, it's time for you to unwind. So kick back and enjoy this very Android-heavy edition of Distro, featuring our first taste of Ice Cream Sandwich, in a preview of Samsung's Galaxy Nexus, our early impressions of Motorola's Droid RAZR and reviews of HTC's Sensation XE and Amaze 4G. If you're not

in the market for an Android phone, we've also got a review of the first Ultrabook to cross the Engadget threshold, the Acer Aspire S3, and a good old Growing Up Geek with Tech News Today's Tom Merritt. **d**

TIM STEVENS
EDITOR-IN-CHIEF,
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EDITOR'S LETTER

Google challenges itself with dueling Android superphone launches, and RIM finally talks QNX on a phone

BY TIM STEVENS



REVIEW

Acer Aspire S3 Ultrabook

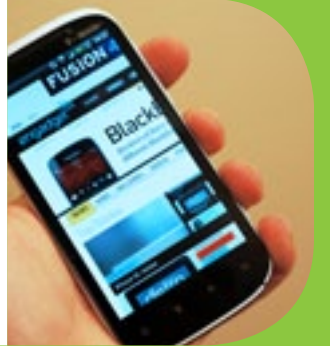
BY DANA WOLLMAN



REVIEW

The HTC Amaze 4G

BY JOSEPH VOLPE



PREVIEW

Motorola Droid RAZR

BY BRIAN HEATER



GROWING UP GEEK

Tom Merritt

BY TOM MERRITT



STATS

Mobile devices may outnumber humans in the US, but they can't take our soul

BY AMAR TOOR



REVIEW

HTC Sensation XE with Beats Audio

BY SHARIF SAKR

LAST WORD

This is the best day of my life!

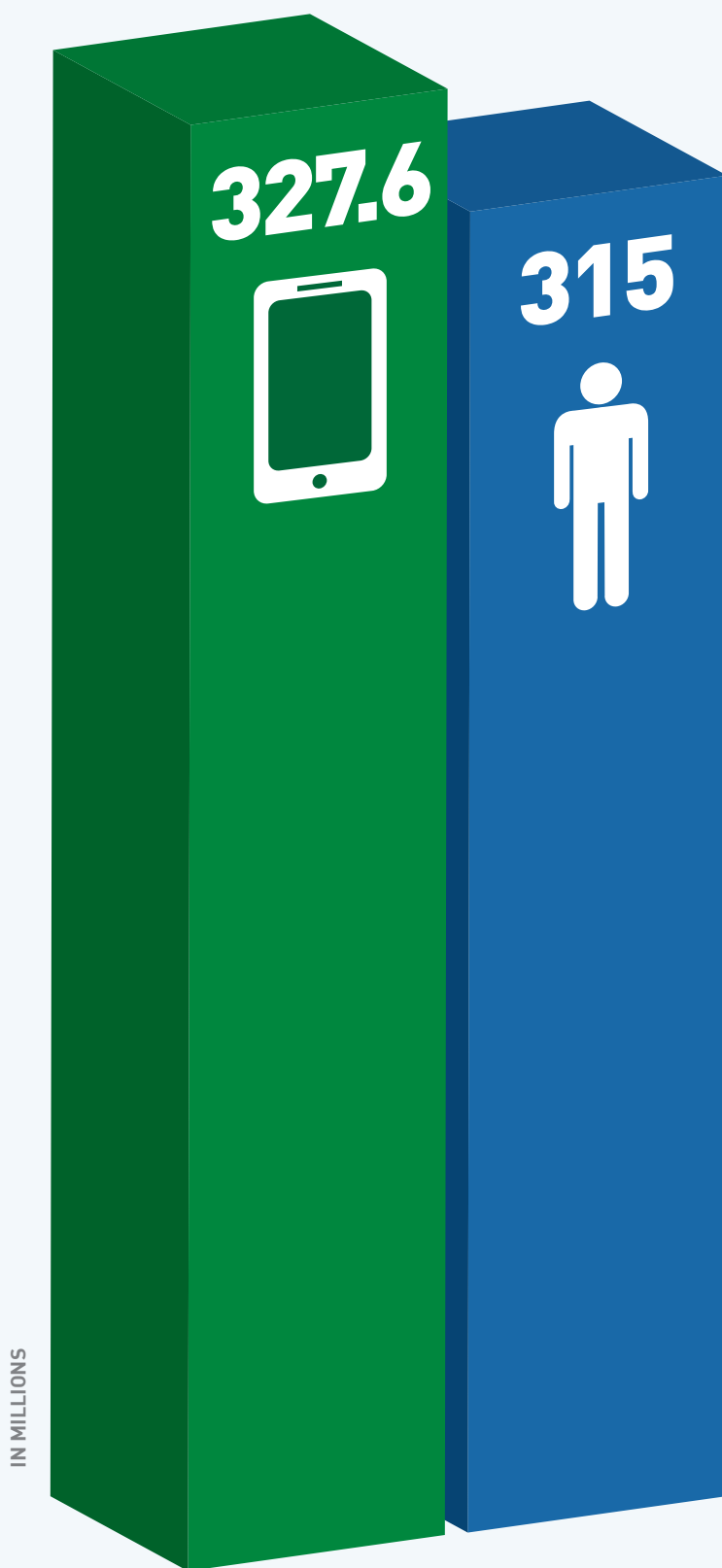
BY BOX BROWN

PREVIEW

Samsung Galaxy Nexus with Ice Cream Sandwich

BY DARREN MURPH





We're not really sure what to make of this, but it looks like Americans may be under siege... from their own cellphones. No, seriously — according to the latest survey from CTIA, there are now more mobile devices in the US than there are human beings. The trade association's semi-annual statistics show that during the first six months of 2011, the number of wireless subscriptions rose by nine percent over the previous year, to a total of 327.6 million. The combined population of the US, Puerto Rico, Guam and the US Virgin Islands, by comparison, is around 315 million. That translates to a nationwide wireless penetration rate of 103.9 percent, and, not surprisingly, a 111 percent surge in data usage. CTIA says these results highlight "the industry's need to purchase more spectrum from the federal government," as well as our collective need to get a life. — *Amar Toor*

Mobile devices may outnumber humans in the US, but they can't take our soul

the weekly stat



review

Acer Aspire S3 Ultrabook

BY DANA WOLLMAN

Until now, Windows fans have had precious few alternatives to the MacBook Air. Sure, there's Samsung's Series 9, but just like the original Air, it's far from cheap. Since then, of course, Apple has cut the Air's starting price to \$999, while the Windows options — now marketed as Ultrabooks — are about to mushroom in number. And so far, they're all starting in the (more reasonable) neighborhood of a thousand bucks, making these pinch-thin, long-lasting laptops accessible to the budget-conscious masses.

Acer's Aspire S3 was the first to hit the market here in the States, and with an entry price of \$899, it's currently the least expensive. That it's skinny (just 13mm thick, to be exact), should be a given, but it also claims to wake from sleep in two seconds flat and reconnect to known networks in two and a half. But, as the least pricey Ultrabook on the shelf, it also forgoes some specs you might have liked to see — namely, all-flash storage and USB 3.0. But does that matter much



when you're potentially saving hundreds of dollars? Let's find out.

Look and feel

The S3 has something of a split personality: understated elegance on the outside, something more pedestrian when you lift the lid. At first glance, it's refined (but never ostentatious) thanks to a cool-to-the-touch brushed aluminum lid that doesn't seem to pick up fingerprints. Make no mistake: this thing makes a strong impression.

Its slender frame doesn't hurt, either. At three pounds flat (1.4kg) and half an inch thick, it's on par with the 13-inch MacBook Air (2.96 pounds / 1.35kg) and the 2.9-pound (1.32kg) ASUS Zenbook UX31. If you've handled a MacBook Air before, its skinny silhouette might not impress you but if (like yours truly) you're used to schlepping a six-pound 15-incher, the difference will feel refreshing, and the ounces separating it from the competition will seem irrelevant. While we're on the subject of comparisons, by the way, we're digging the S3's rounded edges and corners. One thing we dislike about the MacBook Air (or any Mac, really) is that although those sharp edges make for a bold design, resting your wrists on them or pressing your palms into them

can make for a none-too-comfortable ergonomic experience. The S3 is softer in this regard, and it works.

The S3 also has a softer aesthetic under the lid, and that's where the design starts to seem a bit cobbled-together. For one, the display has a habit of wobbling even when you set the machine down, which chipped away at our confidence in the build quality. Also, because the keys, deck, palm rest and bottom side are made of plastic, they seem mismatched against that striking metal lid. We'll spend two paragraphs on the keyboard in just a moment, but for now, suffice to say the problem isn't that plastic keys are uncomfortable to type on; it's just that an all-metal keyboard (à la the ASUS UX21 / UX31) would have gone a long way in pulling together what's otherwise a slick design.

Above the keyboard, a black, rubbery strip interrupts the beige deck. There, you'll find a pair of LED lights along with a metal power button that peeks out even when the lid is closed. Like other Acer laptops, this one features Dolby sound, along with two prominently placed logos to match: Dolby's Home Theater branding on one side of the keyboard, and its "Professionally Tuned" slogan. The bottom of the machine, meanwhile, is studded with



four rubber feet — a homely sight, but not something you'll notice when you're using the machine.

Taking a tour of all the ports and openings, you'll find that the front edge is completely blank, as are the left and right sides, save for a headphone / mic socket and SD slot, respectively. There's also your requisite 1.3 megapixel webcam tucked in the bezel. Really, though, most of the action's to be found on the back edge, where the vent, two USB 2.0 ports, HDMI-out and the AC socket sit in a row. For comparison's sake, the Air has two USB 2.0 ports and a Thunderbolt socket, whereas the UX31 has two USB 2.0 ports and one of the 3.0 persuasion. Meanwhile, Toshiba's forthcoming Portege Z830 will have

USB 3.0, HDMI and an Ethernet jack, while the Lenovo IdeaPad U300s will also have USB 3.0 and HDMI. Even the UX31, which has mini-HDMI *and* mini-VGA ports, at least comes bundled with USB-to-Ethernet and mini-VGA-to-VGA adapters.

Keyboard and trackpad

You might think that if you've seen one chiclet keyboard you've seen 'em all, but the S3's reminds us that some are more (or, in this case, less) tactile than others. Starting with some kind words, the keys have a pleasant, ever-so slightly textured finish, and the panel is rigid enough that it stood firm even as we pounded out stories on deadline. The problem is, there's not much travel here,



which left us craning our hands over the keys, typing deliberately to make sure our presses registered. As we said when we reviewed the current VAIO Z, typing on shallow keys is not unlike trekking around in flip-flops: you know how your toes roll into a claw, pressing into the rubber in an attempt to compensate for the fact that your feet aren't well supported? Well, in the case of the S3, we found ourselves digging into the keys with concerted effort since there's otherwise not much to latch onto. All told, the MacBook Air's keyboard is the cushier of the two. (Then again, if we're talking ergonomics, the Air is no ThinkPad either.)

For what it's worth, though, we were able to type the brunt of this review on the S3 with only the occasional spelling error — and that's despite the fact that all of the major keys (Enter, Tab, Caps Lock, Backspace and right and left Shift) are shrunk. The arrow keys are especially miniature here, so if you're like us and regularly use them to highlight text, you'll find yourself pining for a keyboard that's a little less crowded. What's more, the brightness and vol-

ume controls are located on those arrow keys, which means even if you don't use them for anything else, they're still unavoidable.

Even when we first saw the S3 back in August, one of the first things to make an impression was that spacious trackpad. Even after spending more time with it, the integrated button still feels stiff — a flaw we were willing to chalk up to pre-production kinks when we got hands-on at IFA. Similar to the keys, the touchpad has a slightly textured finish, and while it sometimes made for a frictionless experience, it more often slowed us down, even as we tried to do something rudimentary like drag the cursor across the desktop. We also noticed that this giant clickable pad sometimes mistook our left clicks for right ones — a quirk we've noticed in other laptops whose trackpads have integrated buttons. At least this is something that can be remedied with a software update.

Despite all this, two-fingered scrolling generally works as promised — a pleasant surprise considering the grief multi-touch trackpads can cause when executed poorly. It's not perfect, though: although pinch-to-zoom works reliably, you'll have to concentrate a bit (and apply some pressure) to make text resize to the exact scale.

Display and sound

The S3's 13.3-inch display has 1366 x 768 resolution, which is common for laptops this size. In fact, the Portege Z830 and IdeaPad U300s will tap out with

If you can wait until year's end to pull the trigger, Acer will release additional models with Core i3 and i7 processors and expanded storage capacity.

the same pixel count. Still, the 13-inch Air sports a 1400 x 900 panel, while the UX31 steps up to 1600 x 900 resolution. When we were using just one program at full screen, the S3's low-res panel was more than adequate for reading documents and scrolling through web pages, but we felt the squeeze keenly when we used Windows 7's Snap feature to view two pages side by side.

For what it's worth, high-def videos looked plenty crisp on that display, and we enjoyed decent viewing angles from the sides once we dimmed the lights. We didn't have as much luck head-on, though; even when we dipped the display forward slightly, the picture appeared washed out. Not good news when the person sitting in front of you on the plane decides to lean all the way back.

And how's the sound, you ask? Not bad — depending on the sort of music you're into. Pop songs, such as Lady Gaga's "The Edge of Glory" sounded more or less as we'd expect them to, though the speakers' limitations became obvious when rap tracks like "Hypnotize" took on a distinctly metallic quality.

Performance and graphics

Right now, there's one configuration of the S3 available in the States, and it

has an ultra low voltage 1.6GHz Core i5-2467M CPU, 4GB of RAM and a hybrid drive that combines a 320GB HDD for accessing files and a 20GB SSD for storing the operating system. If you can wait until year's end to pull the trigger, Acer will release additional models with Core i3 and i7 processors and expanded storage capacity.

So how does the performance stack up? Well, that depends on what metric you use. If we go by benchmark scores, it falls short, frankly. Particularly when it comes to overall power, the current MacBook Air trounces it, thanks to all-solid-state storage, equal RAM and a similar 1.7GHz Core i5 processor. In PCMark Vantage, the most general of the performance tests we run, it notched 5,367, while the Air managed 9,484 in Bootcamp. In 3DMark06, we expected the two systems' graphics performance to be similar, as both machines rely on an integrated Intel graphics card. Indeed, the gulf was smaller, but still significant: the S3 scored 3,221; the Air, 4,223.

Right now, our ability to judge by the numbers is limited: the S3 is the first Ultrabook to hit the market, and so we don't yet have scores from the ASUS UX21 / UX31, the IdeaPad U300s or the Portege Z830. We'll flesh out our

COMPUTER	PCMARK VANTAGE	3DMARK06	BATTERY LIFE
Acer Aspire Ultrabook S3	5367	3221	4:11
13-inch, 2011 MacBook Air (1.7 GHz Core i5-2557M, Intel HD Graphics 3000)	9484	4223	5:32 (Mac OS X) 4:12 (Bootcamp)
Samsung Series 9 (1.7 GHz Core i5-2537M, Intel HD Graphics 3000)	7582	2240	4:20
Lenovo ThinkPad X1 (2.5 GHz Core i5-2520M, Intel HD Graphics 3000)	7787	3726	3:31 6:57 (slice battery)

performance chart in due time, but for now, the only fair comparison is with the MacBook Air, not just because it's arguably the inspiration behind the S3 and others, but because it's the only other machine you can buy that's comparably priced with a pinch-thin design and ultra-low voltage innards.

Instant-on and real-world performance

Still, as far as real-world performance goes, the S3 deserves more credit than that. Say what you will about its benchmark scores, but we freely went about our everyday business, jumping between at least half a dozen tabs in Chrome, checking email and Facebook, chatting over Google Talk, loading YouTube videos and downloading and installing apps. It also boots up in a more-than-respectable time of 45 seconds. Through it all, that vent 'round back did a fine job of expelling heat — the laptop always felt cool to the touch. We *did* notice the occasional hang, though — for instance, while we were installing a program, the machine took its sweet time opening Windows' advanced power settings.

This also might be a good time to tackle the S3's two key claims: that it automatically connects to stored WiFi networks in 2.5 seconds, and that it resumes from sleep in two seconds — provided the machine hasn't been asleep for more than half an hour. After all, these are things that can immeasurably improve your daily grind with the thing, and that won't be reflected in pat, four-digit benchmark scores. Indeed, without fail, the machine consistently resumed from sleep in two seconds (less, actually, according to our stopwatch). That's a faster showing than we saw when the S3 debuted at IFA, and it's perfectly conceivable the company has ironed out a few kinks since then with final software. As for connectivity, we tested Acer's 2.5-second claim by turning off WiFi and then timing how long the computer took to reconnect once we flipped the radio back on. Indeed, two Mississippis passed, though the scenario we created is, admittedly, an unrealistic one. After all, how often do you really disable WiFi? We were also curious to see how long the computer took to latch onto our home network at start-up, and found



that time was more in the neighborhood of 35 seconds. No different from our experience with other notebooks; just don't expect that Acer's technology will let you bypass that routine delay.

Battery life

The S3's three-cell, 3,280mAh battery is rated for six hours of active use, or 50 days of standby time. In our standard rundown test, which involves looping the same movie with WiFi on and the brightness fixed at 65 percent, it lasted four hours and eleven minutes. Now it's true, you can eke out more than that if you just bum around online and refrain from playing a movie off the hard drive, but let's not forget that in that same video playback test, the current MacBook Air lasted five hours and thirty-two minutes in its native OS X (in Bootcamp, it managed just four hours and twelve minutes). Again, we'll be in a better position to grandstand about bat-

tery life once we've reviewed competing models by ASUS, Lenovo and Toshiba, but for now, that gap in runtime doesn't exactly bode well.


Software

The S3 comes with a fair share of pre-installed software, including your requisite security software (McAfee Internet Security), Microsoft Office 2010 and Windows Live Essentials. Less typical, though, are additions like the Times Reader, Skype 5.3, newsXpresso, Nook for PC and an eBay desktop shortcut. You'll also find a good deal of Acer-branded apps, including clear.fi for sharing media files over WiFi and utilities for tweaking power management and sleep settings. To be fair, even after we removed Bing Bar, Office, Norton Online Backup, Skype, newsXpresso, Nook for PC, Times Reader and that annoying eBay shortcut, our boot-up time held steady at about 45 seconds.

Wrap-up

We wanted to love the Acer Aspire S3, the same way we're rooting for all of these reasonably priced, impossibly skinny, long-lasting laptops that have the potential to give the MacBook Air a run for its money. Indeed, it's priced aggressively — \$200 less than the UX31 and \$400 off the 13-inch Air. It performs well enough for everyday use, stays cool throughout and keeps its promise to resume from sleep in two seconds. You'll have a mostly enjoyable experience if you pounce, and we'd sympathize if you ended up going with the least expensive option.

But now that we've spent some time with it, we're not sure it should be the poster child for Team Windows. What's more, something tells us the best Ultrabook is yet to come. Whether or not you agree that the S3 isn't quite the looker that the Air or ASUS Zenbook is,

the fact remains that it relies on hybrid HDD-flash storage and, as a result, trails the MacBook Air in both battery life and all-around performance. Though we haven't tested them yet, we wouldn't be surprised if ASUS' Zenbooks have a similar advantage given that they, too, use all-flash storage. Stick around for more Ultrabooks and you'll also see multiple options with USB 3.0. If you absolutely must buy a laptop of this ilk right now, you'll get better performance and longer battery life from the MacBook Air and possibly one of the Zenbooks, but if you're more comfortable with Windows or are simply platform-agnostic, we highly suggest you sit tight and survey what's likely to be an ample field of contenders. 

Dana Wollman is Reviews Editor at Engadget, a marathoner, lover of puns and a native Brooklynite.

BOTTOMLINE

Acer Aspire S3 Ultrabook

\$899.00

PROS

- Relatively inexpensive
- Thin and light design, runs cool
- Resumes from sleep in two seconds

CONS

- Disappointing battery life
- Trailing performance
- Stiff touch button

The first Ultrabook to go on sale in the US is as thin and light as you'd expect and also happens to be the cheapest, but it's battery life and performance are underwhelming



review

The HTC Amaze 4G

BY JOSEPH VOLPE

What do you do when you've already created a sensation? If you're HTC, you repackage that lightning in a *slightly* different chassis, turn the volume (read: speed) up to 11 and borrow a bit of optical wizardry to add that new smartphone smell. All key elements that can be found in the DNA of the company's latest imperatively named product offering — the Amaze 4G. Clearly, HTC's throwing caution to the fickle consumer winds here, raising the bar for Android users' expectations and mixing in just enough razzle dazzle to win over those hard-earned geek dollars. So, what's the hook this time

'round? No, not Beats — that's for its Euro stepcousin, the Sensation XE. Here, the main attraction is this handset's ability to surf along T-Mobile's HSPA+ 42Mbps network. That's right, Magenta's tiptoeing into LTE speed territory and you've got Sense 3.0 to help pilot that wireless ride. Join us as we peel back the layers of this unibodied mobile onion.

Hardware

Right out of the box, there's no denying your first impression will be one of shock. The Amaze 4G bucks the 'thinner is better' trend that we've seen the



likes of Samsung and its Galaxy S II variants adopt in favor of a large and in charge 5.1 x 2.58-inch design philosophy. Though the handset may not be much thicker than its competitors, at 0.46 inches (11.7mm) thick, its 6.1-ounce (0.17kg) heft certainly gives off the opposite impression. With a similar 4.3-inch qHD super LCD display, the phone picks up right where the Sensation left off, although in this iteration that Gorilla Glass-coated screen spills out of its aluminum confines a tad too much for our tastes. It's an odd design flaw that HTC could have easily remedied by tapering the edges down into the phone's frame, rather than subjecting users to indented palms. Still, as the majority of your usage will most likely

have everything to do with data consumption and less to do with carrying on an actual phone call, you'll hardly be bothered by this discomfiting quirk.

One of the first things we noticed when booting up the Amaze 4G was the minute pixelation on its qHD display. It's not terribly obvious, nor is it particularly irksome, but when compared to the similarly super LCD-equipped Droid Incredible 2, this screen is simply dull. Colors on the device appear washed out, and viewing angles take a dramatic hit at 45 degree tilts. It's a far cry from the crisp images and vivid hues achieved by its current competition, the Galaxy S II. And while it would've been nice to see HTC outfit the phone with a Super AMOLED Plus display, we're

There's no denying it — the Amaze 4G is a handsome handset.

sure the sheer expanse of the screen will override any of your resolution-centered grouching.

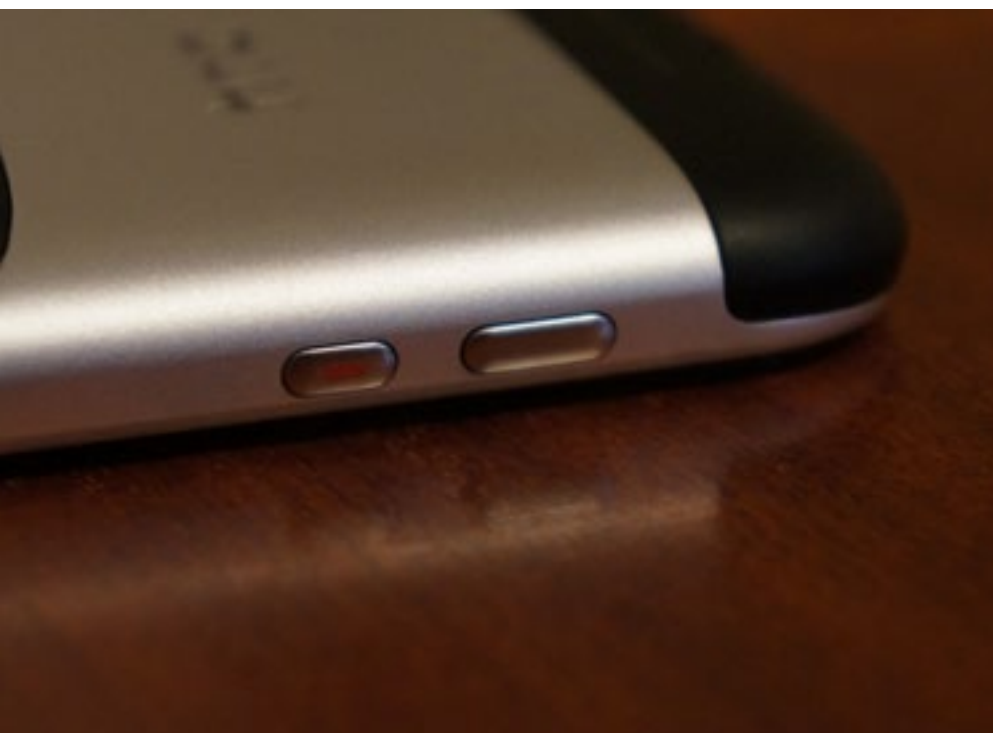
There's no denying it — the Amaze 4G is a handsome handset. We've seen other past and present high-end smartphones (e.g., the Nexus S and Droid Charge) belie their internals with cheap-feeling, scuff-prone frames, but that's not the case here. HTC's wrapped this HSPA+ present in a unibody mixture of metal and soft touch plastic that not only inspires confidence in the device's durability, but also goes a long way towards justifying its on-contract \$260 price tag. Embedded throughout its metallic perimeter are the usual array of inputs and controls. Down at the phone's base, you'll find both a microphone and battery door latch — the latter of which makes accessing the phone's guts an absolute breeze. Up top, a power button and 3.5mm jack preside, with the volume rocker and dedicated camera buttons over to the right. On the left-hand side, a lone micro-USB port breaks up the device's otherwise unblemished chrome trim.

Nestled between the HTC and T-Mobile branding at the very apex of this 960 x 540 screen is the admittedly underpowered earpiece which houses an embedded notification LED. Flank-

ing it on either side are a front-facing 2 megapixel camera and proximity sensor. Around back, we find a speaker grill directly adjacent to an 8 megapixel shooter with dual LED flash, and lurking below that soft touch back is an NFC chip — the first for an HTC device, although there isn't much use for it yet. Moving on to the exposed internals, we have the requisite SIM card slot, accompanying 1,730mAh battery and vacant microSD card reader. The handset comes packed with an ample 16GB of onboard storage, but if you're looking to load it up with an abundance of audiovisual goods, you better plan on supplying additional capacity.

Performance and battery life

Let's not beat around the bush, though. In the rush to get this 42Mbps capable device to market a few rough edges were overlooked — namely, battery life. Consider the Amaze 4G a kind of Thunderbolt redux: both phones unleashed into the market ahead of their time, destined to bear the torch of heretofore unseen speeds (well, for HSPA+, at least) at the heady sacrifice of daily usage. It could be the dual-core architecture or the demands of the "4G" network, but whatever the culprit, expect a good three to four hours of action before



hitting a productivity ceiling and plugging back in to your nearest outlet. A three-hour charge should get you back up to 100 percent and running — until the next three hours, that is.

In our short time with it, we've found the phone will consistently drain from fully juiced to about 30 percent after just three hours of light to moderate use — that's with Twitter, Google Reader and two email accounts synced. Toss in some casual web browsing, a YouTube video or two and a half an hour GTalk session, and the aforementioned four hour limit is easily reached. Power users should heed this warning and turn a blind eye to the

Amaze 4G's tantalizing promise of next-gen wireless wonderment, as the oft-recommended need for an extra battery would here be multiplied by two.

You want benchmarks, you say? Well, we've got 'em by the loads. In the name of a fair fight, we've lined up these various CPU / GPU stress tests against Magenta's own Galaxy S II variant. For Quadrant, Sammy's beastie beat out the Amaze 4G, scoring 2,576 vs. 2,514. Linpack averaged about 51MFLOPS, easily topping the GSII at 42MFLOPS for single thread and, again, yielding 77MFLOPS vs 70MFLOPS in multi scoring. And the benchmark dominance continued on,

with our handset's Neocore score inching over the GSII's 57fps at 59fps.

How does all of that translate into real-world performance? Truth be told, you won't even notice the dual-core chipset chugging away beneath that rapidly warming back. In fact, an average consumer coming from a single-core 1GHz device would be hard pressed to spot an appreciable speed boost. The real vim and vigor becomes apparent when running several apps at once, a feat commonly known as multi-tasking. We ran Pandora in the background while responding to emails, running Google Talk and Maps, browsing the web and scouring the *New York Times* app for the latest on Occupy Wall Street. To HTC's credit, the Amaze 4G stood up to the test and passed with uninterrupted flying colors.

Network speed and call quality

By now, you're most likely wondering what sort of downlink pizzazz is in store if you do choose to claim this phone as your own. Well, in our jaunts around New York City, we've recorded inconsistent HSPA+ network speeds. That's not to say T-Mobile's service around the farther reaches of the Big Apple is spotty. On the contrary, 4G signal strength was surprisingly strong, dropping down to 2G only twice to our knowledge. But when that 15Mbps / 1.7Mbps magic did happen, it was primarily on the outskirts of the city. Within Manhattan's crush of people and buildings, download speeds hovered in the 6Mbps to 8Mbps range, only occasionally topping out at 10Mbps

down — nothing to sneer at, but certainly nothing to applaud either.

If you absolutely insist on using your handset to make (gasp!) phone calls, get set to dig that earpiece and the edges of the screen deep into the side of your head. Even with the volume cranked up to the max, we had a hard time hearing our callers, who sounded distant and muffled. On the upside, loudspeaker performance is quite robust, and should enable you to move freely around while carrying on that gossip fest. Reception, too, was relatively strong and our voices came across crisp and clear on the other end.

Software

Of course, this is the Android show — 2.3.4, to be exact — but you wouldn't know if from the Sense 3.0 smothering at play. It appears as if HTC didn't want to load up the Amaze 4G with an accompanying suite of freshly updated software, and instead saddled prospective owners with an outdated version of Gingerbread and its penultimate UX. Perhaps the company needed to reserve the Sense 3.5 fuel for its gimmicky stab at mobile fashion, a.k.a. the Rhyme. No matter, the Amaze 4G's 1GB of RAM and dual-core 1.5GHz Snapdragon S3 CPU handily beat out any further OEM embellishments or flashy plum-colored finishes.

We have to tip our hat to that beefy Qualcomm chip, as not one iota of lag cropped up in our testing. Transitions between Sense's carousel of home-screens were fluid and devoid of hiccups. Web pages on the inbuilt browser



rendered swiftly, capably handling the demands of Flash and other various plug-ins. And equally as impressive was pinch-to-zoom, which responded immediately to our touch with nary an instance of checkerboarding.

Unfortunately, it wouldn't be an Android device if it didn't come bogged down with an array of carrier-installed bloatware. For the Amaze 4G, however, the pre-loaded shenanigans don't quite incite frustration the way Verizon's crapware-heavy devices normally would. Here, the operator-inserted apps like 411 & More, Adobe Reader, Lookout Security, More for Me, Polaris Office and Qik Video Chat are arguably useful, though definitely not essential to the experience.

To get a real sense of the newly bestowed powers of 42Mbps HSPA+, you need go no further than T-Mobile TV HD. The app, which offers a mix of live and on demand content, has been around since the introduction of the Samsung Galaxy S 4G, and gets a real jump start from Magenta's new wireless threads. A live MSNBC program played back almost instantly, however the quality of video stretched across the device's 16:9 dimensions was noticeably poor, and undeserving of the HD labeling. As for that on demand content, a full episode of ABC's *Happy Endings* downloaded in its entirety within seven minutes — all thanks to T-Mo's zippy (at times) 4G network. Curiously enough,

on both the streaming and downloaded video, audio was noticeably out of sync, rendering the couch potato on-the-go viewing experience a trifle annoying.

Camera

No doubt, T-Mobile intends to lure willing customers in with the promise of super network speeds, but the true crown jewel of this HTC flagship device is actually its camera. The Amaze 4G borrows the same backside-illuminated 8 megapixel module found on the myTouch 4G Slide, and unsurprisingly, it performs just as well here. It's clear the company intended this phone to be a replacement for your point-and-shoot, tacking on camera shortcut keys and bundling it with user-friendly photo software. We put the 3.69mm lens and its various scene modes to the test and came away mostly convinced — this might be all the camera you need. That's not to say we don't have our gripes. While the incessantly autofocus sensor definitely has its perks, we struggled on more than one occasion to get the focus ring to settle and let us snap a clear shot. Additionally, low light shots, even when taken in Night mode, often resulted in grainy, oversaturated pictures. As for video, recordings made in full 1080p HD came off largely without a hitch, displaying good contrast and sharpness of detail, although we did note an occasional decrease in frame rate from time to time.

Keeping the camera tech fresh for amateur photogs are two new HTC-added features — SmartShot and PerfectPics. Despite its promise to sample multiple shots and deliver a smile-laden *compos-*



ite photo, SmartShot is essentially a useless and ineffectual mode. After dozens of failed and frustrating attempts, we were only able to procure five successful images, with the rest being a blurry mix of happy / sad faces. As for PerfectPics, well that's less of a mode and more of a *smart gallery*. Using an algorithm, the software parses through your photo collection and deposits your Avedon-worthy series of still life shots in a separate gallery. It may just be our artistic bias, but we're inclined to believe PerfectPics' critical eye is all a bunch of hooey. Bizarrely enough, many of our least favorite photos made their way into this A.I. curated collection, leaving our vastly superior photos lumped in with the rest.

We have to hand it to HTC on this one: the zero lag shutter and constantly autofocus f2.2 sensor lend themselves well to fits of sudden photographic inspiration. If you see something that catches your



The Amaze 4G's eight mega-pixel camera and its luddite-proof scene modes got a virtual workout on our tour of New York City. The autofocus sensor generally captured vivid images in fine detail, although low-light performance was a mixed and often grainy bag.



fancy, all it takes is a drop of the camera app into the lockscreen ring and, *voila!*, you're right there, finger on the shutter, capturing the moment you thought would slip by. This ease of use gradually becomes addictive and, in time, you're likely to take it for granted. As you can see in the samples above, our tour of Central Park gave way to fleeting moments of filmic brilliance that would otherwise have been lost with a lesser-equipped phone.

Wrap-up

So, does HTC's new flagship manage to live up to our high expectations and its hyperbolically named state of awe? We'll put it this way: a better moniker for this girthy handset would've been the *Kind of Awesome 4G*. As a daily driver, the Amaze's bound to leave you high and dry a few short hours into your day, critically hampering your busy work / social schedule with its power-hungry demands. Sure, you can obsessively monitor your

screen's brightness, manage syncing and hold off on the mobile video consumption until you're close by to an outlet, but the name of this industry game is *wireless*, and T-Mob's Galaxy S II's already out of the gate. Ignore this phone's battery life shortcomings, and you're left with an elegant camera module and T-Mobile's just out of reach 42Mbps HSPA+ dangling carrot. Simply put, it's just not practical to opt in for a high-end device that will, sporadically, treat you to downlink speeds that are half of what's been promised, and desert you in the process. At the end of the day, the purchase choice is yours to make, but for our money, we'd hold out for something packing a wee bit more milliamperes-hours. The Amaze 4G XL with Beats, anybody? It's inevitable, and you know it. d

Joseph Volpe is ambiguously ethnic. He is also an Associate Editor at Engadget.

BOTTOMLINE

T-Mobile HTC Amaze 4G

\$260 on contract

PROS

- Attractive design
- HSPA+ / theoretical 42Mbps network speeds
- Easily accessible camera and camcorder shortcuts

CONS

- Pixelated qHD display
- Short battery life with moderate usage
- Handling the phone is slightly uncomfortable

Despite being one of T-Mob's first HSPA+ 42Mbps phones, HTC's Amaze fails to stun with its subpar battery life and washed out qHD display.



Growing Up Geek: Tom Merritt

BY TOM MERRITT

Welcome to Growing Up Geek, an ongoing feature where we take a look back at our youth and tell stories of growing up to be the nerds that we are. Today, we have a special guest: journalist and broadcaster Tom Merritt, current host of Tech News Today on TWiT.tv.

I always hesitate to apply the term geek to myself. To me it's an honorific. Someone with super mad skills or knowledge deserves the term, and the superior of all those who deserve it is the alpha geek. But times being what they are, geek has become a term of currency. Before I let this devolve into a debate about the difference between geek and nerd, let's move on to the evidence.

You, dear reader, can decide for yourself where on the geek scale I belong.

My love affair with things geeky begins with a pocket calculator and *Star Wars*. They were my two obsessions growing up. At first it was a little candy-buttoned calculator with an LED readout, my Dad used for his food science that I would use to spell hello by typing 01134 and turning it upside down. But

then Dad brought home the TI-30. It had memory. It had Log functions. It taught me what sine and cosine were. It had a cardboard cutout that let me calculate my biorhythms. (It was the 1970s after all). I dominated the thing so much, that my Dad was forced to buy a second one in order to be able to use it for work stuff.

Then, of course, came *Star Wars*. I don't recall exactly why, but I first saw it at a drive-in theater in Springfield, Illinois as a double feature with *Grizzly Adams*. I loved it. It was space. It was adventure. It was everything movies had never been to me before. I was obsessed with the action figures. To this day I still drift through department store toy sections to look at the *Star War* toys, just to get a brief reminder of the jolt I had examining the ever-expanding collections available when I was 7. I had to split my collection with my sister at first. Thank goodness she hit puberty first and gave up her interest. But I still sort of think of C3PO, Princess Leia, and Chewbacca as weirdly belonging to my sister.

My movie and TV interest proceeded along a predictable path. I embraced *Battlestar Galactica*, including the PhotoNovel, as the heir of Star Wars on television. And of course, was glued to TV for all Star Wars specials, including the famous Life Day one. *Superman*, *Buck Rogers*, *Tron*, *War Games* and more all followed in good order. I watched *Star Trek* with my Dad on Sunday mornings at 11 AM on Channel 11. He liked it



because he had been in the Navy. I liked it because of spaceships.

But I wanted stuff to be real. Which leads me to the two greatest decisions in my geek childhood.

The first came in the summer I went to “science camp” at Kaskaskia College and got to choose three courses. I chose futurism, chess, and computers. Futurism got canceled, because I was apparently the only 11 year old interested. Computers, on the other hand, was packed. Upon entering the room for the first time, I was confronted with two columns of tables. On the right side of the room sat tables with TRS-80s. On the other side were Apple IIs. I still to this day wonder if the teach-

ers of that two week class knew what they were doing when they forced this choice. I made a fateful choice and sat on the Apple II side.

The next fateful choice came later that summer. I had saved for quite awhile to buy an Atari 2600. Several of my friends had it and I dreamed of playing *Pac-Man* and *Space Invaders* at home. I brought my bank full of money to the department store with its \$99 (a fortune!) in it and strode up to the shelves with the Atari boxes on them. My heart was beating fast. This was the moment I had been waiting for. As I reached with probably trembling hands to take the box off the shelf, my Dad stopped me.

“Before you decide, I have an offer for you.”

My heart fell. He was going to stop me from getting the Atari 2600 somehow. I knew it.

“You can buy the game thing if you want. Or, I will give you an extra hundred dollars, and you can buy that.” He pointed to the TI 99/4A. Which sat on the shelf next to the 2600s with a price tag of \$199.99. I felt angry. How dare he! This was my moment of triumph and I would be left without the Atari I had dreamed of. But then, that was a real computer he was pointing at.


“I can get the Atari if I want?” I asked. My Dad reassured me that would be fine, but he wouldn’t give me any extra money in that case. He was offering me matching funds. A subsidy to get me to buy a real computer.

I realized I would be getting more

for my money. Then I noticed the cartridge slot on the TI. “And I can buy games for the TI too?” Dad agreed that yes I could buy games. It was settled. I went home with the TI-99/4A and probably as a reward for my smart decision, Dad sprung for a copy of *TI Invaders* and *Parsec*.

I was off to the races. Soon I was filling up cassettes with slot machine programs, text adventures and who knows what. Eventually my programming skills, such as they were, outstripped the TI, and I either needed the Expanded Memory and Advanced Basic cartridge or a new computer.

I got a Commodore 64 for Christmas. And a 1541 floppy drive. By High School I was actively swapping floppies with kids in the neighborhood and running a fantasy baseball league out of my room, using *Micro League* for the C64.

Eventually I left home and got an IBM PS/2 and was a Windows person, active on Gopher, and Usenet and that darned graphical Web that brought all the problems I predicted but was worth it anyway. In the mid part of the 2000s Boot Camp lured me back to my roots and the world of Apple. And recently I bought the complete *Star Wars* on Blu-ray. I know, some of you will say not to encourage these Lucas changes, but I can’t help it. That is also my roots. 

Tom Merritt can be found on Twitter @acedtect, Google+, and of course every weeknight at 2:30pm PT / 5:30pm ET as the host of Tech News Today.



Motorola Droid RAZR

BY BRIAN HEATER

To everyone who rocked a Motorola RAZR in the '00s, it's time to get excited again. The line — or at least the name — has been reborn, and not without good reason. This is a thin device — extremely thin. The Droid RAZR by Motorola is 7.1mm thin, in fact, and holding it up next to the iPhone 4 makes Apple's phone look downright beefy by comparison. At 127 grams, it's also incredibly light, a fact that's quite apparent the first time you hold the thing — we were honestly a bit surprised when it was first dropped in our hands. The company has clearly come a long way from the first generation Droid.

Of course, as noted, Motorola didn't skimp on the specs here. The RAZR's got a 1.2GHz dual-core processor and 1GB of RAM inside, and it zips through apps with ease. The handset is rocking

Android 2.3.5 Gingerbread — or at least was when we got our hands on it. The 4.3 inch qHD Super AMOLED display is quite bright, and should do wonders on those Netflix HD videos.

Also of note is the phone's relative ruggedness, thanks to its Kevlar backing, diamond cut aluminum and Gorilla Glass, but in spite of these facts, it really doesn't feel or particularly look like a rugged device in your hands, just a big, surprisingly light handset. It's a slick, fast, thin phone that certainly seems worthy of the RAZR name we all know and love.

Zach Honig contributed to this report.

Brian's work has appeared in Spin, The Onion, Entertainment Weekly, The New York Press, PCMag, Laptop, and various other publications.

Motorola Droid RAZR



DIMENSIONS

height: 130.7mm
width: 68.9mm
depth: 7.1mm
weight: 127 grams

CAMERA

Rear-facing: 8 megapixel,
1080p HD video recording
Front-facing: 1.3 megapixels

BANDS

LTE, CDMA / EVDO

STORAGE

16GB internal + 16GB microSD

PROCESSOR

Dual-core 1.2GHz TI OMAP 4430

OPERATING SYSTEM

Android 2.3.5

DISPLAY

4.3-inch
960 x 540 qHD Super AMOLED

MEMORY

1GB RAM

PRICE

\$199



Samsung Galaxy Nexus with Ice Cream Sandwich

BY DARREN MURPH

Samsung's just busted out the planet's first Ice Cream Sandwich-based smartphone here in Hong Kong, a few days late but hardly worse for the wear. The Galaxy Nexus (formerly referred to as the Nexus Prime) carries on the Nexus torch in spectacular fashion, and we spent a few quality moments with one at Tuesday's launch. Design-wise, it's clear that the Nexus S DNA is here, though the rear reminds us most of the Galaxy S II. Those who abhor physical

buttons will also be delighted, and while we'd gotten used to the whole Power + Home for a screenshot on the GSII, Power + Volume Down works just fine on this fellow.

The 1.2GHz dual-core processor was startlingly fast. It actually felt a wee bit quicker than our Galaxy S II, and given that Ice Cream Sandwich and the Galaxy Nexus were apparently built for one another, we're assuming there's some deeply ingrained optimizations to



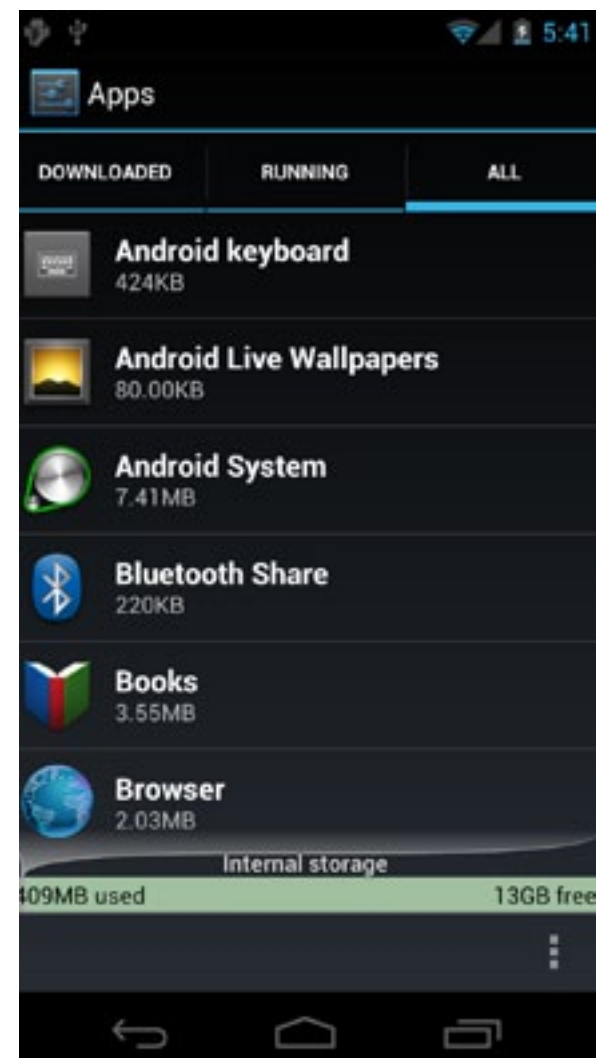
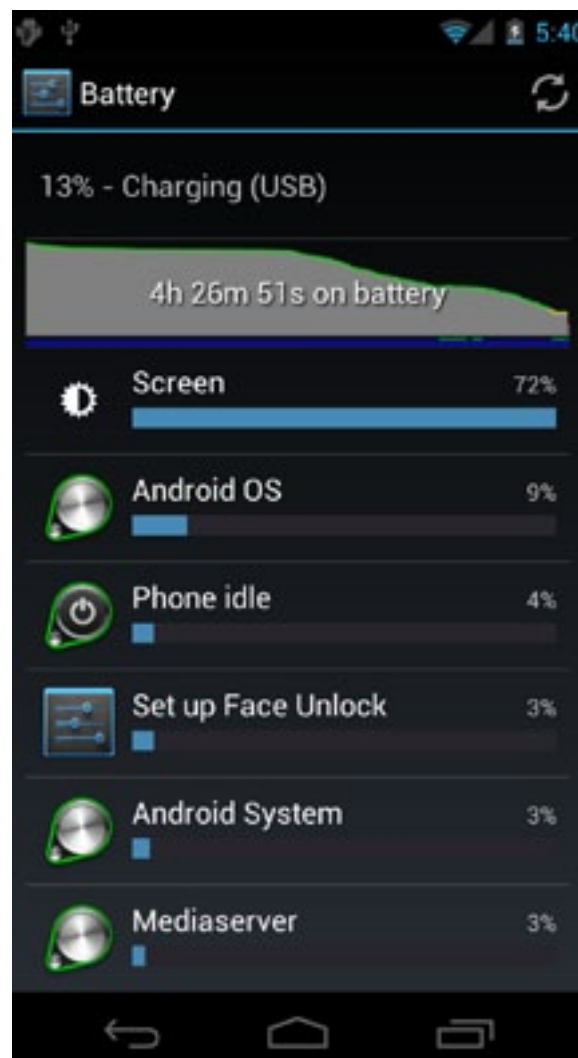
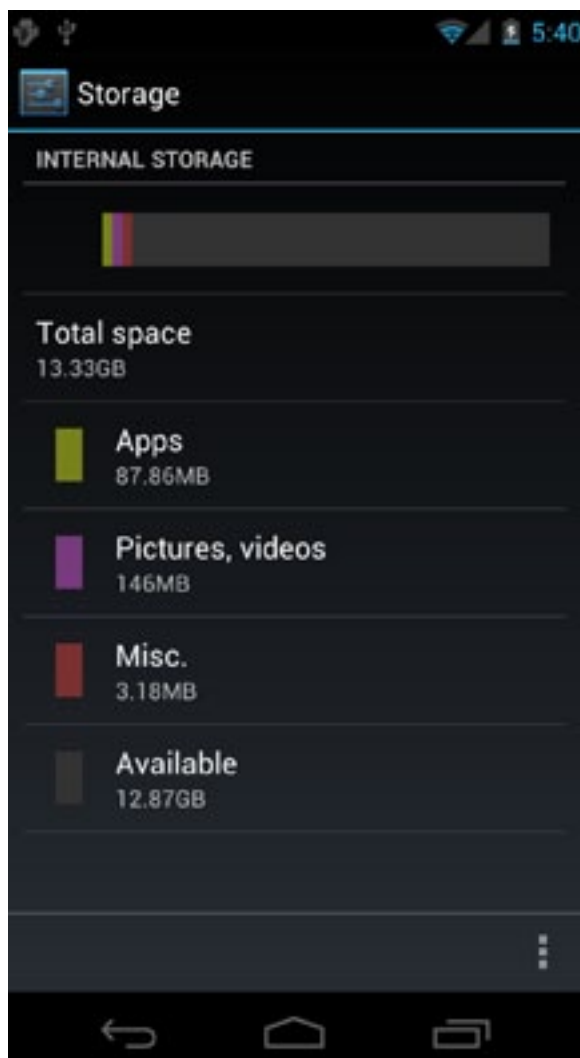
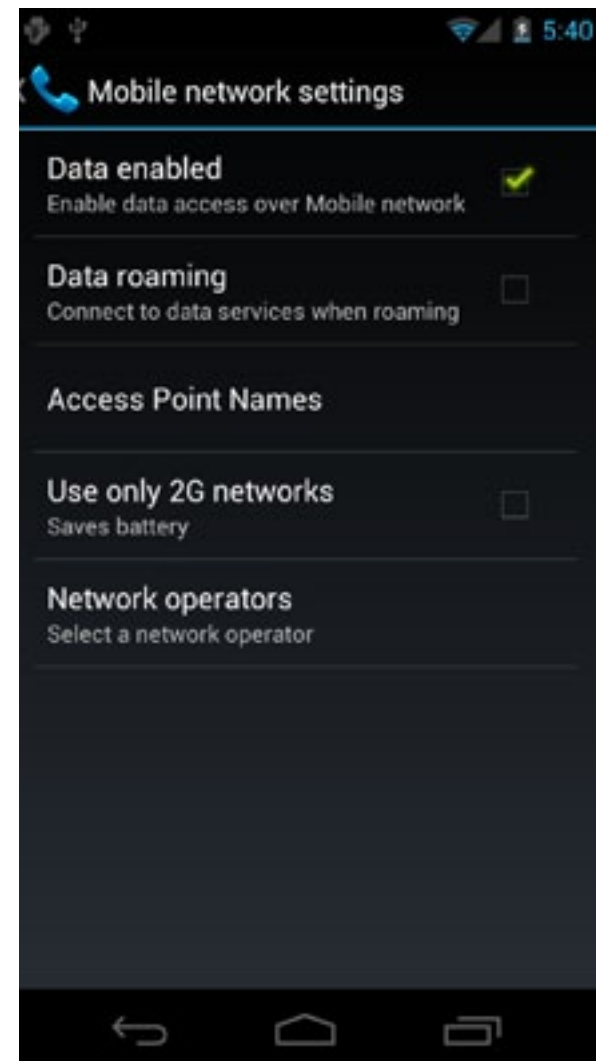
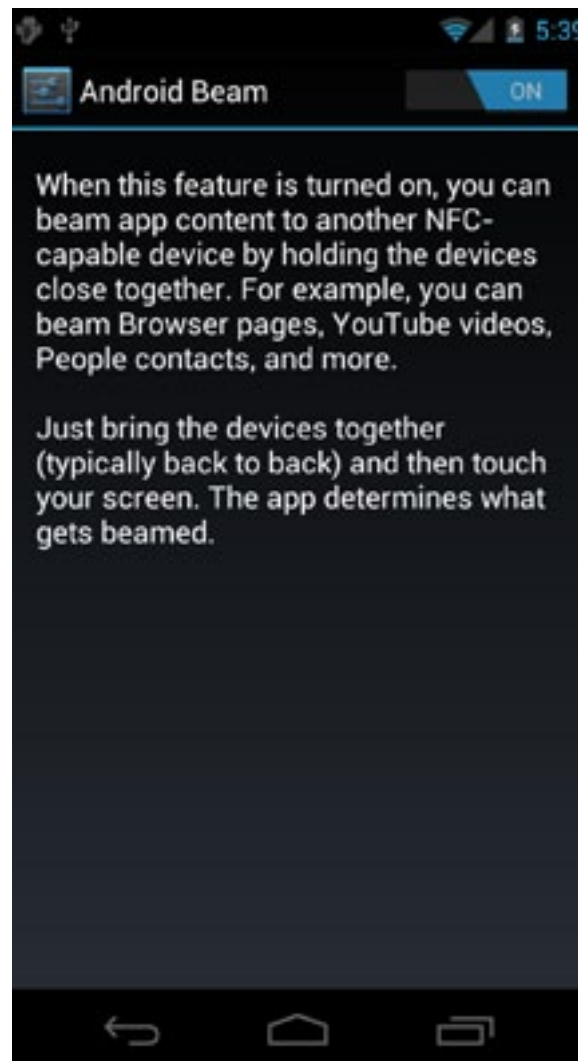
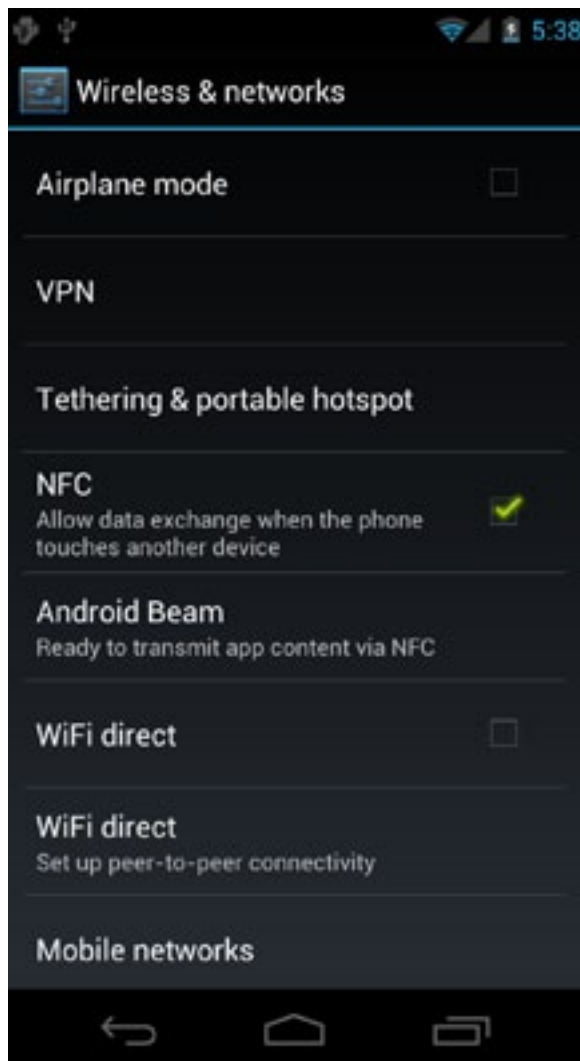
thank. Swiping from pane to pane was faster than its ever been on Android, and the new Roboto font actually is super eye-pleasing.

The overall phone feels adequately thin, and while the 4.65-inch display sounds gargantuan, the handset itself doesn't feel so massive to hold. Until, of course, you grab the comparatively minuscule Nexus One. Still, we've been clamoring for a 1,280 x 720 display on a smartphone for what feels like forever, and now that it's here on the Galaxy Nexus, we aren't about to kvetch. Indeed, the panel looks downright gorgeous, with unbeatable viewing angles, remarkably crisp text and graphics and a beautiful feel as one swipes across it. The fingerprint magnet that is a glossy overcoat is still here, but it's the only feel niggle we've found on the screen as a whole.

Having the 3.5mm headphone jack on

the rear seems like a necessary design choice given the tapering at the top, and unlike that *other* phone, there's no mute switch here — you'll just have to hold the Volume Down button for a few seconds. The rear cover pops off in similar fashion to the Galaxy S II, but the ridged plastic cover has a far softer touch than the aforesaid contemporary. The camera is also situated right in the center, with branding kept to a minimum. Oddly enough, we're being told by Samsung that two models will be available in terms of capacity — a 16 gigger and a 32GB sibling — but neither will have a microSD slot for adding your own expansion.

The lack of a physical Home button may be disorienting for Galaxy S II loyalists, but the Galaxy Nexus is truly the first smartphone that expresses Google's desire to make "one Android





for all” — a mantra we heard about at Google I/O, but haven’t seen birthed into anything until now. Digging into the particulars of Ice Cream Sandwich a bit, it’s clear that folks who aren’t elevated to Android 4.0 (we’re still waiting on word of what phones will and won’t make the leap) will be missing out on a fair bit. Face Unlock isn’t particularly special in our estimation — typical laptops have been using this forever, and we’ve never found ‘em to be entirely intuitive. However, the bump-to-share functionality that was lost when webOS croaked will undoubtedly be cause for celebration. Also, just so it’s known, the Galaxy Nexus we played with here was running Android 4.0.1.

The data usage manager is a total godsend in this nasty, depressing world of tiers, and while apps have done similar things for quite some time, tight

integration like this is hugely appreciated. We found in our play time that ICS was amazingly responsive in every aspect. Swiping was a breeze. Gestures worked beautifully. The entire experience just felt *polished*. In a way, it’s as if Android’s growing a bit and maturing before our eyes, and it’s obvious that Goog’s focused on making its mobile OS as “enchanted” (Google’s word, not ours) as iOS seems to be.

Overall, we’re thrilled with how the first ICS handset has turned out. It’s understated, sleek, beautiful and packs a display that’s destined to drop jaws. Now, if only we knew how much, and what carriers...

Darren holds the Guinness World Record for being the most prolific professional blogger on planet Earth. He’s also an argonaut.

Samsung Galaxy Nexus





review

HTC Sensation XE with Beats Audio

BY SHARIF SAKR

We had some hands-on time with HTC's new European Android flagship a short while back, but it wasn't nearly enough to answer all our questions about how the 4.3-inch, 1.5GHz dual-core XE compares to the original 1.2GHz Sensation, or whether the implementation of Beats Audio was anything more than a cunning scheme cooked up between the manufacturer's marketers and Dr. Dre's agent. Now, though, this phone has been our closest

companion for long enough to reveal its true colors. They're red, primarily, but there's a whole rainbow of detail in the following paragraphs.

Hardware

In many respects this is not a complete review, because we've avoided covering the same ground we already trod extensively in our review of the Sensation. Instead, we've focused only on those areas where there have been significant



changes, or where the passage of time has altered a particular spec's standing with respect to the ever-eager competition.

In particular, we spent a great deal of time looking into Beats Audio — far too much time, perhaps, if you've already convinced yourself that this Dre hookup is nothing but a gimmick. But we felt that since HTC has invested untold dollars in Beats in order to differentiate itself from the competition, and since it plans to bring the this technology to many more devices in the US and around the world, then we ought to try to come up with something definitive and — if at all possible — scientific. By all means, if you're just curious about this phone's musical prowess then skip down to the Software section, but for now we'll start off with the key hardware features.

Just like the original Sensation, the XE is well-built and beautiful to behold. Its tapered edges and smooth wraparound aluminum case conspire to make it feel thinner than the 11.4mm statistic might suggest. Of course, the XE differs in its coloring and when we first heard

about the red accents we were worried they might look cheesy, like a Qosimo gaming laptop or something, but our fears were misplaced. The coloring of the navigation button back-lights, the speaker grill and the ring around the camera lens all helped to lift this phone above the plain black and silver hordes. The speaker grill and front-facing camera both have glinting chrome borders which make them look extra special. Add in the bold red headphones with the Beats logo on the back of each bud and it's an all-round good look — unless you would prefer your gadgets to be more discreet.

If you grip the phone hard you'll feel and hear slight creaks from the plastic-aluminum hybrid construction, but it's far less than what you get on purely plastic phones. We should also mention that no matter how we held the device, we failed to encounter any of the so-called “death grip” issues that people complained about with the first Sensation.

Perhaps the only nits we'd pick — and they're much smaller than your average nits — are the tendency of the border

between glass and aluminum around the panel to collect dirt which cannot easily be cleaned, plus the strange slant of the power button. We should probably disregard this latter flaw, since the device in our hands-on didn't have it and it could simply be a factory error or a result of transit damage. Nevertheless, if wonky power buttons turn out to be an issue with this phone, then remember: you heard it here first.

Processor

We didn't have an original Sensation to compare against the XE side by side, but we did have an EVO 3D to throw into the mix, which has a 1.2GHz dual-core Qualcomm MSM8660 processor that's very similar to the Sensation's MSM8260. The comparison isn't perfect, because the EVO 3D has 1GB of RAM instead of 768MB, but it's nevertheless sufficient for an indication of what 1.5GHz delivers in terms of real-world advantage — which turns out to be not a great deal. The EVO 3D actually booted much quicker than the XE, taking just eight seconds from 'Off' to snapping a picture on the camera. Meanwhile the XE took 11 seconds to do the same thing — possibly because the extra Beats Audio logo animation takes a few extra seconds at boot up.

Our Quadrant Standard benchmark scores clustered around 2080, which was significantly more than the EVO 3D (1800) but only slightly more than the original Sensation (2000). Linpack gave us 43MFLOPS for the XE, versus

41 for the EVO 3D and 46 for the Sensation — so nothing worth shouting about there either. Meanwhile, the Sun Spider javascript benchmark for browser speed timed the XE at approximately 3,300ms, which was much healthier than the strangely slow 6320ms time from the EVO 3D, but not a great deal quicker than what you'd get from the single-core iPhone 4. Forgetting benchmarks for a minute, the fact remains that webpage rendering on the XE was impeccable.

Our impression was that anything the XE could do, the EVO 3D could do just about as well, so the extra 300MHz doesn't count for much at all in practice. We can't help but notice that the chip in the XE is identical to that in the original Sensation and has merely been overclocked — something savvy Sensation owners are perfectly capable of doing themselves.

Battery Life

HTC bumped the battery up to 1750mAh in the XE instead of the original 1520mAh, ostensibly to let you listen to more tunes but also, perhaps, to compensate for the 300MHz bump to the original Sensation's clock speed. The lower part of the case heats up whenever you put the processor under any serious load and you can just imagine how those two cores must be gulping down energy. After a 14-hour day of heavy use, including a ton of music, a few photos and a bit of video, the battery fell to eight percent by the time we

got on a train home. It subsequently fell to three percent after listening to about 30 minutes of music and then finally died after taking four final night-time photographs. In other words, there's no forgiving fuel tank here; when the battery says it's nearly dead, it really is. However, just like with the original Sensation, the phone is frugal with power while it's idle and on a less busy, more normal day we'd still find around 30-40 percent of the battery remaining when we plugged the phone in to charge.

In our regular battery test, looping a standard-def video with low-to-mid connectivity and push settings, the phone died somewhere between five and six hours, which is slightly below average for a large screen device. For the sake of reference, the 3.7-inch single-core BlackBerry Torch 9850 lasted 20 percent longer in this test — which merely shows that the Sensation XE pays for its specs in battery life.

Camera

The camera hardware in the XE is identical to that in the original Sensation, so check out that review for a full appraisal. All we really have to add is that the slight increase in clockspeed with the XE might translate into a minor improvement in the time it takes to load up the camera app and start capturing video or stills, but it's nothing particularly noticeable — after all, the original Sensation was no slouch in this regard to begin with.

On the other hand, one thing has



changed significantly since the XE's predecessor, and that's time. As the months have progressed and new handsets have come to market, we've become less forgiving of XE camera's flaws — particularly with video. The auto-exposure isn't particularly smart, and it adjusts too quickly when filming video, with ugly results compared to the camera in the HTC Titan and Sensation XL — which have far better camera units. Moreover, the sound recording is terrible: its default sensitivity of the mic is way too high, resulting in clipped audio whenever the person holding the camera speaks, or when there's a gust of wind or any other sharp noise.

Still images suffer from the fact that you can't change the compression settings, which means the output from the eight megapixel sensor is often ruinously over-compressed to as little as 600KB. HTC's panorama mode, which we've enjoyed on the Titan and XL, is absent here, too. Altogether, the camera counts firmly against the XE and feels way more outdated than the display panel.

SOFTWARE

Beats Audio

HTC's marketing department has gone to town with Beats Audio. For the record, here's some of the language they've used to describe it:

- "Beats by Dr Dre and HTC will work together to reengineer how sound is delivered so that the consumer feels the music the way that the artist intended.

- "When it comes to doing music justice, you're way ahead of the crowd with... Beats Audio™"

- "The tailor-made headset is specially engineered to deliver extraordinary sound. Finally, hear what you've been missing."

In general, this hyperbole condenses down to two separate claims: that the XE makes music sound more like the original artist intended, and that it also involves tailoring the music output to the matched Beats headphones.

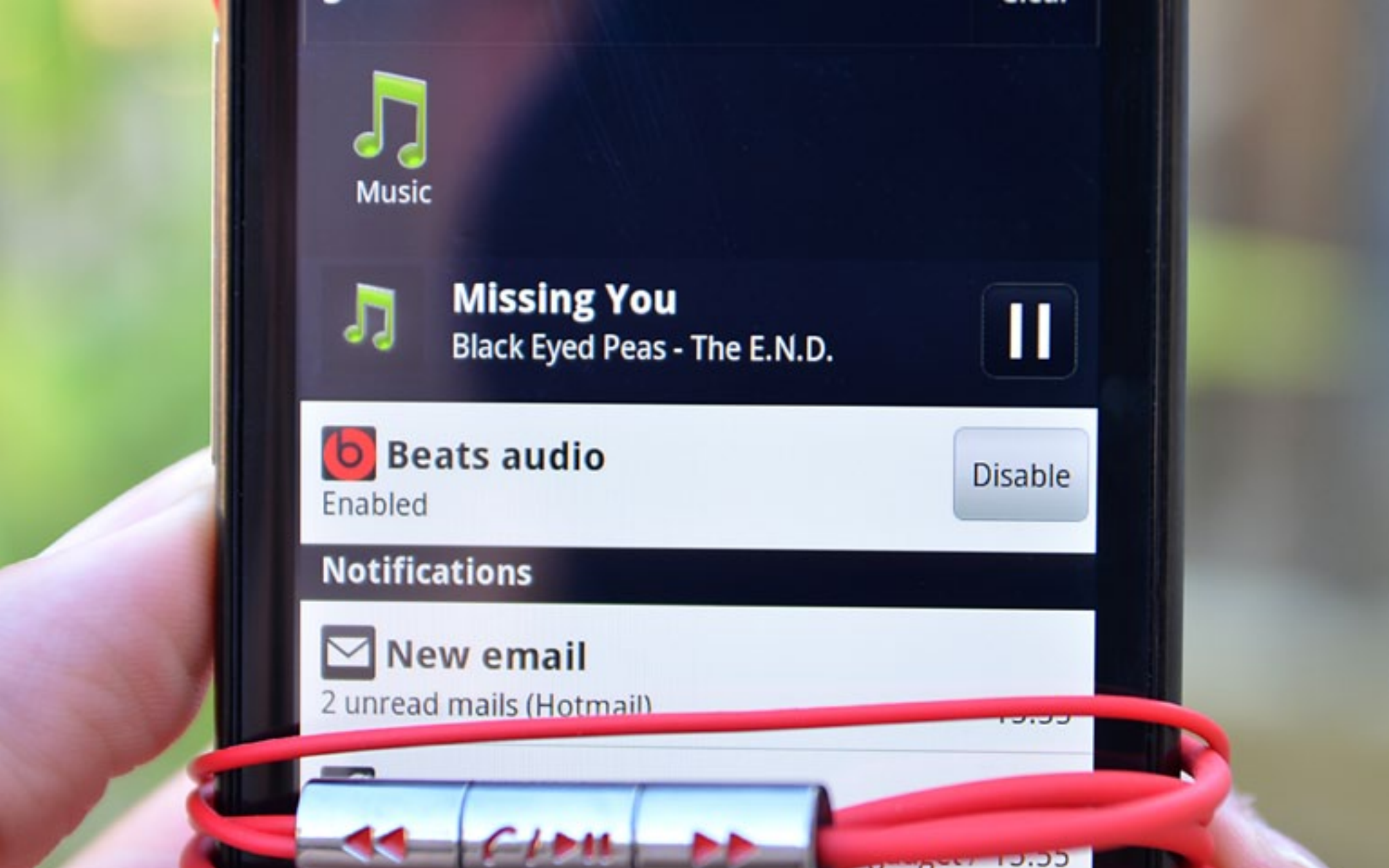
Beyond these two claims, there's very little in the way of factual information from HTC about what exactly Beats Audio is. When we've interviewed HTC reps on this point, the conversation has generally ended up being about "sound profiles," which we take to mean EQ settings — or the way certain frequencies are lifted or depressed in order to change the way music sounds. This fits with the impressions we had in our in-

itial hands-on with the XE: that Beats Audio is simply an EQ setting that comes to life when you attach Beats-accredited headphones in order to lift the bass and some of the upper frequencies and hence deliver a more lively experience with certain genres of music.

We know that the Beats Audio EQ can sound great with the right type of music, but we need something more objective than that. So, with EQs as our starting point, we decided to test out HTC's claims about Beats Audio with help from the friendly chaps at AMS Acoustics in North London. Thanks to their input, we now have a ton of objective information about exactly what Beats Audio does. Indulge us with your patience and we'll do our best to explain.

Round One

We started out by testing the XE with the packaged YourBeats in-ears, which are re-branded iBeats with the addition of HTC's in-line controls. Our test involved playing pink noise on the XE, with BA first enabled and then disabled, and recording the sound using a mic specially modified for the analyzing this type of earphone. This yielded two different power spectra, which are presented as simple tables showing the amplitude (in dB) of each frequency



(in MHz) of the pink noise. Subtracting the first spectra (BA off) from the second (BA on) revealed the Beats Audio EQ, — i.e. how, exactly, the XE modifies the sound when you activate Beats Audio. For corroboration, we also ran a different test signal through the XE and YourBeats in order to get a “frequency response curve,” which is basically just a higher-res power spectrum depicted as a line graph.

The first thing our tests revealed was that the Sensation XE and packaged headphones form a bass-heavy system, even before you activate Beats Audio. Looking at the raw data with BA disabled, we see that the lowest frequencies still have the highest amplitude, while the higher frequencies get steadily quieter. This EQ is the equivalent of old-

school “bass boost” and we’ve listened to enough music with BA off to know it sounds just about as boring.

Our next step, of course, was to enable Beats Audio, and this changed the picture entirely. Suddenly, there’s a massive boost to most of the treble frequencies as well as the bass, which prevents the treble from just trailing off so dismally. Looking at the Beats Mode EQ column above, we can describe the EQ as S-shaped: it has a hump at the lowest frequencies, then a valley in the middle, and a second hump at the top. This is significant because, for many types of music, an S-shaped EQ is greatly preferable to one which simply emphasizes the bass. Subjectively, activating Beats Audio when listening to music does exactly what we’d expect from a good



S-shaped EQ: it gives the music more presence by emphasizing the bass and vocals, while depressing the less interesting mid-tones — but only when we’re listening to an appropriate genre of music such as hip-hop or house. When listening to orchestral music, activating Beats Audio does nothing good.

In addition to the treble boost, most of the other frequencies are also amplified to a greater or lesser extent, delivering an overall jump in loudness that screams “Beats Audio ON!” in the language of pure decibels. This is supported by the frequency response curve

below: the BA-enabled curve follows the BA-disabled curve very tightly, but is significantly higher (i.e., louder) all the way along — with the extra boost at the bass, upper mid-range, and highest trebles that we’ve already observed.

At this point, we can debunk one of HTC’s more ostentatious claims about Beats Audio, which is that it somehow “reengineers” music to make it sound “the way the artist intended.” For this to be true, the Beats Audio EQ would need to flatten the system’s output, to make music sound more faithful to the source recording — just as studio

monitors do. But Beats Audio does no such thing. We'd suggest that this makes music sound the way Dr. Dre (or his engineers) intended: with a certain S-shaped EQ that suits his kind of music. In fact, when we suggested this to an HTC rep during our hands-on, he didn't contradict us. Round one therefore goes to the skeptics — albeit, with the caveat that Dre's EQ can actually sound really good when you try it with the right type of music.

But we have another question to answer before we call it a match: HTC's second claim about Beats Audio being tailored to the packaged Beats headphone. Does the same Beats Audio EQ get activated regardless of which headphone is plugged in? If the answer is "yes," then the consumer is simply being duped into thinking a dumb EQ is more than it is. If the answer is "no," then the marketing spiel has some justification.

Round Two

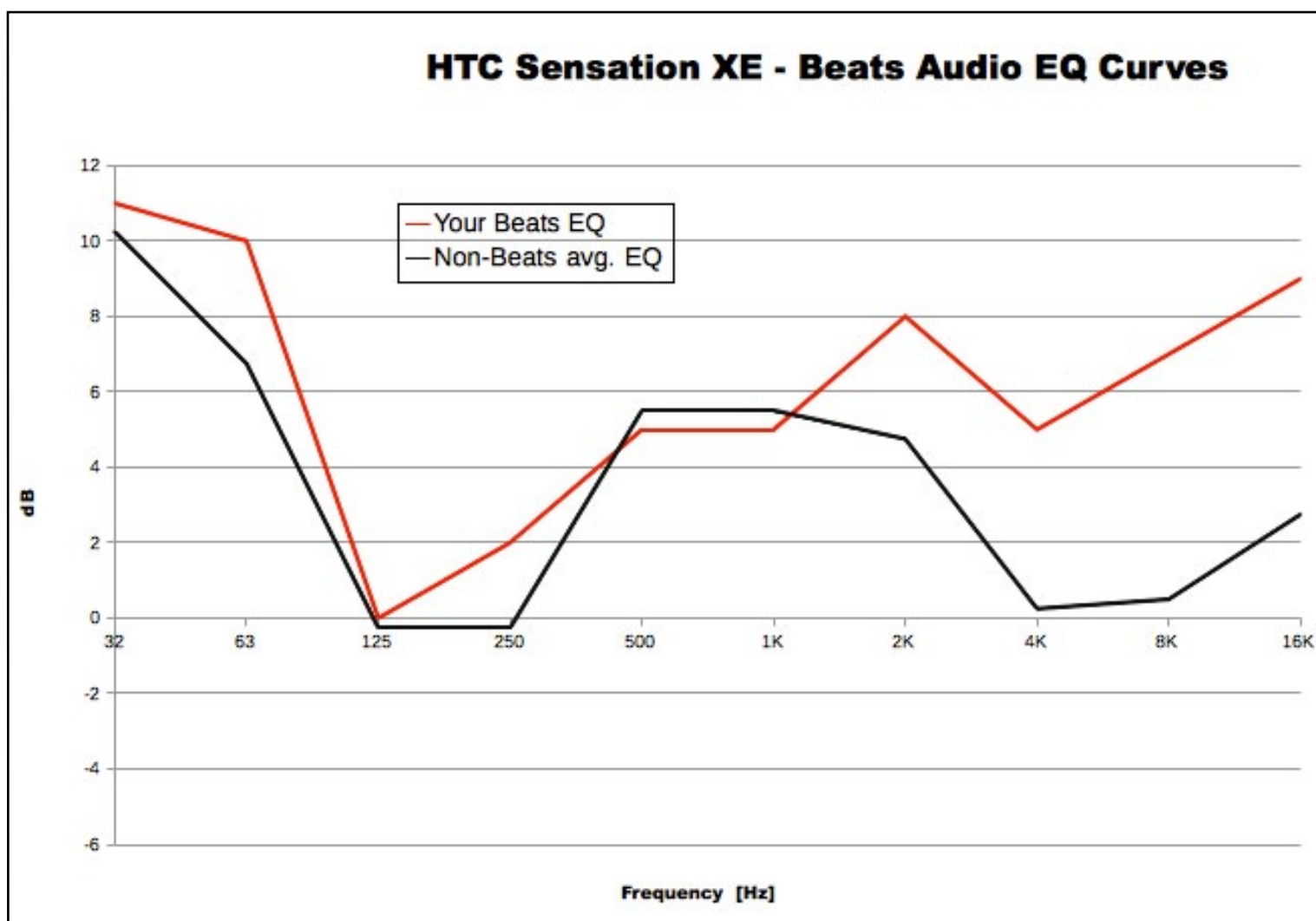
Our approach in this round was to run the pink noise test with three other sets of headphones: Senn CX300 in-ears, Senn HD598 over-ears and a pair of Beats Studio active over-ears. We threw in the Beats Studios to mix things up a bit — they're part of the Beats range but they're not officially supported by the XE. Currently, the only supported headphones are YourBeats and Beats Solos, with the latter soon to be sold with the new limited edition Sensation XL.

We should also clarify at this point that our XE allowed us to activate

Beats Audio with whatever headphones we liked. However, it only explicitly acknowledged the YourBeats headphones, which triggered a popup message on the XE's screen when we plugged them in. We're not sure this is how HTC intended the software to behave — in fact, we've been told that Beats Audio should not be available with the third-party headphones. But this is how the review device worked for us — and a good thing too, because it allowed us to learn a lot more about Beats Audio.

So, starting with Beat Audio disabled, we noticed that the same excessive bass was apparent with the CX300 in-ears. However, when we moved on to the more expensive and more balanced over-ear headphones, the bass boost was matched by a similar boost to the lower trebles. This suggests that XE has been designed with a relatively common S-shaped sound profile already, even without Beats Audio enabled, but this treble amplification is largely lost with the in-ear Senn CX300, just as it was with the packaged YourBeats.

What happened when we activated Beats Audio in these tests? Well, this is where it got interesting. With the Senn CX300, Beats Audio further boosted the bass as well as some mid-range frequencies, but it totally failed to remedy the lack of treble. In other words, the EQ it applied was clearly different to that with the YourBeats, and the end result was nothing like Dr Dre's S-curve we discovered in the last round. The same can be said of both the over-ear



headphones we tried: they generally displayed the same pattern, with a bass and mid-range boost, but the end result was nothing like with the YourBeats. This is illustrated in the graph above, which compares the Beats Audio EQ with the YourBeats, versus the average Beats Audio EQ with the other headphones. The shapes are totally different, and the key difference is the treble.

This tallies with what an HTC rep told us about the way Beats Audio works: the XE has multiple sound profiles stored within it. It has separate and specific profiles for the YourBeats and Solos, plus a third 'generic' Beats Audio profile for other headphones, which are inherently less tailored. We can only assume that the YourBeats EQ above represents the tailored sound profile, while

the other headphones were all given the generic BA profile, which looks significantly different. It's entirely possible that the Beats engineers were aware that the YourBeats headphones have trouble delivering the treble end of the S-curve and so deliberately adjusted the tailored EQ to compensate. This means we must notch up a point for HTC: Beats Audio does appear to tailor the XE's output to suit compatible headphones and deliver a predictable and good-sounding S-shaped power spectrum.

This leaves us at a 1-1 draw between HTC and the skeptics. The skeptics won a point when the Beats Audio power spectrum proved to be S-shaped and hence have nothing to do with "what the artist intended." HTC drew level when it turned out that Beats Audio only



delivers this particular S-shaped spectrum with the compatible headphones. So can we call it quits? Nope, we need a final round.

The Decider

If we take a step back from all these charts and consider the fundamental value of what Beats Audio achieves, then we have to come down squarely on the side of the skeptics. No matter how much effort we put into testing this thing, the fact remains that these ‘sound profiles’ are just EQ settings. You can achieve exactly the same effect using PowerAMP, which costs \$5 and allows you to create your own EQs. PowerAMP can tailor and save your EQs to suit current headphones and even to the track you’re listening to, in order to get the sound just right. The app can also apply the EQ to lossless music, which cannot be played by the XE’s stock player and therefore cannot be listened to with Beats Audio enabled. Listening to the Black Eyed Peas in Apple Lossless format, with our own PowerAMP EQ and the YourBeats headphones, provided a great experience — and it was achieved while Beats Audio was switched off

and irrelevant.

Sure, you might think lossless is overkill, and you might not have the patience or the time required to experiment with your own EQs. But we think that anyone who loves listening to music would surely appreciate having full control, and if HTC was true to its marketing they would have made this possible. If, in addition to Dre’s EQ and headphones, Beats Audio also meant we had an amazing stock player, with tons of EQ customization and a better user interface than PowerAMP, we’d be happy. If HTC went whole hog and threw in a high-end DAC to improve the overall quality of the XE’s output, we’d be over the moon. There’s still plenty of time for HTC to make improvements like that, but until then we can only conclude that Beats Audio is mostly a gimmick.

Wrap-up

The Sensation XE is a great phone, but it is no more or less great than the original Sensation. Sure, it has some spec bumps, but these are minor and cancelled out by our concerns about the display and camera, which haven’t aged well over the last five months.



The Beats Audio software isn't complete marketing vapor, but it's still inherently gimmicky and adds nothing in the XE's favor: you could achieve a better result on the original Sensation simply by downloading a third-party music player that lets you play with the EQ settings yourself.

The only thing which might sway us to by the Sensation XE over its predecessor is the packaged YourBeats headphones, coupled with the red styling on the phone. But for us to opt for the XE, it'd have to be priced similarly to the original Sensation, such that we're not paying much extra for these headphones. They're only good if they're a bargain — otherwise we'd prefer to take matters into our own hands and spend \$80 to \$100 on some Etymotics, which would be even better. **d**

Sharif is a British tech journalist with ten years' experience filming and reporting news for the BBC and other broadcasters.

BOTTOMLINE

HTC Sensation XE w/Beats Audio

£450.00^{UK}

PROS

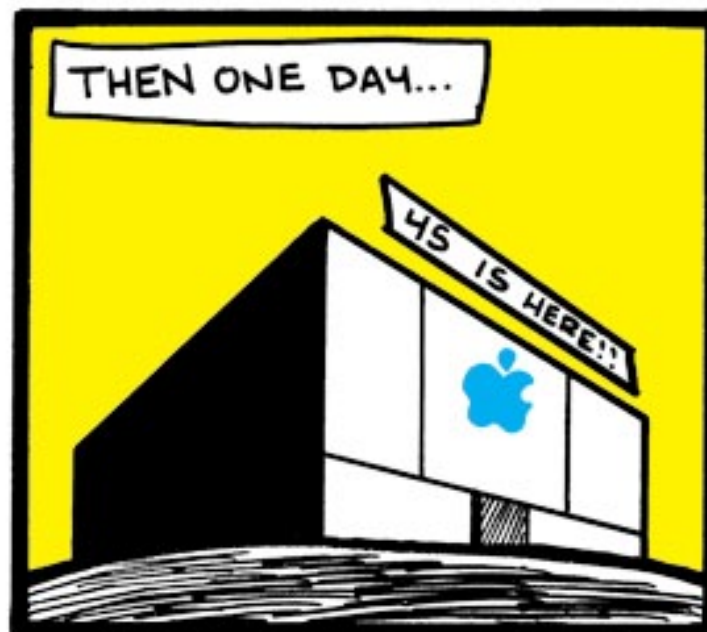
- Good build quality and aesthetics
- Great packaged headphones

CONS

- Beats Audio is largely a gimmick
- Aging display technology
- Camera isn't up to par, especially with video
- The extra speed isn't worth the battery drain

The XE doesn't improve much on the first Sensation and better phones are hitting the market. Did we mention Beats Audio is a gimmick?

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